

## PBL on basic research about fuel cell utilizing molten metal

Implementation period	Implementing country	SIT's implementation partner organization	Target students	participant	SIT instructor
2019/08/11 ~2019/08/22	United States	Worcester Polytechnic Institute	<ul style="list-style-type: none"> <li>•Department of Engineering Science and Mechanics</li> <li>•Undergraduate 3rd grade, Undergraduate 4th grade</li> </ul>	(SIT) Students 3, Professor 1 (Worcester Polytechnic Institute) Students 3, Professor 1	ono naoki(Department of Engineering Science and Mechanics)



Image 1

In this research-oriented PBL, the students did basic research and theoretical simple analysis related to new fuel cell system utilizing molten metal, under the kind guidance of Prof. Powell. This is one of the research projects in Prof. Powell's laboratory at WPI. Especially, the students investigated bubble behavior in the liquid metal. The bubbles are CO gas generated at the surface of the Zirconia electrode. Carbon atoms are kind of fuel material and soluted in the molted metal. They predicted the bubble rising velocity and shape in the liquid, and proposed some ideas about removing bubbles efficiently from the electrodes. From Prof. Powell's laboratory, three students sometimes joined the program and had discussions about the results.

This new fuel system is basically in the field of electrochemistry or materials engineering, but the issues in the field of fluid mechanics and heat transfer are much contained in the development of the new method. Prof. Powell and Ono are planning to do collaborating research about its development from this year.

They also visited MIT, from which Prof. Powell graduated and MIT-Japan office in it. They had good cultural visits in Boston since Boston city is one of the best centers of academism (university and research centers) and arts (fine arts and music and so on). END



Image 2

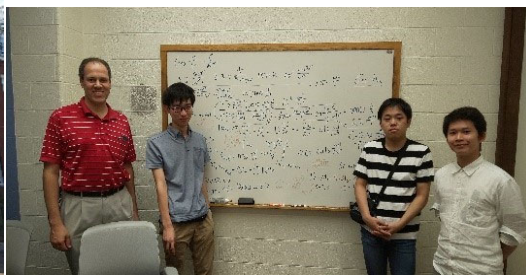


Image 3



Image 4